estimate in response to the first and second estimate signals and the first and second input signals".

In contrast, the Alamouti reference discloses an apparatus in which there is a SINGLE signal path from each of plural remote antennas 31 and 32 to remote antenna 51 since the disclosure is limited to time division multiple access (TDMA). As a result, Alamouti fails to disclose multiple signal paths between a transmit antenna 31 OR 32 and a receive antenna 51 or 52.

In order that the rejection of any of Claims 14, 15, 17-19, 21, 22-25 be sustainable, it is fundamental that "each and every element as set forth in the claim be found, either expressly or inherently described, in a single prior art reference." Verdegall Bros. v. Union Oil Co. of California, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See also, Richardson v. Suzuki Motor Co., 9 USPQ2d 1913, 1920 (Fed. Cir. 1989), where the court states, "The identical invention must be shown in as complete detail as is contained in the ... claim".

Furthermore, "all words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).

From the discussion above, it is apparent that independent Claim 14, as amended, is not anticipated by Alamouti. Moreover, the Examiner has provided no evidence from the prior art that would lead one having ordinary skill in the art to re-engineer the Alamouti device to have multiple signal paths between a transmit antenna 31 or 32 and a receive antenna 51 or 52, without the improper hindsight provided by Applicants' disclosure

Claims 15, 17-19, 21 and 22-25 stand allowable as depending, directly or indirectly, from allowable Claim 14 and including further limitations not taught or suggested by the references of record.

Dependent Claim 15 requires and positively recites, a mobile communication system as in claim 14, further comprising a combining circuit coupled to receive a plurality of first symbol estimates including the first symbol estimate and coupled to receive a plurality of second symbol estimates including the second symbol estimate, the combining circuit producing a first symbol signal in response to the plurality of first symbol estimates and producing a second symbol signal in response to the plurality of second symbol estimates. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 16 requires and positively recites a mobile communication system as in claim 15, wherein the input circuit, the correction circuit and the combining circuit are formed on a single integrated circuit. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 15.

Dependent Claim 17 requires and positively recites a mobile communication system as in claim 15, wherein each of the first and second symbol signals include at least one of a pilot symbol, a transmit power control symbol, a rate information symbol and a data symbol. Being that Alamouti discloses a TDMA system, it fails to teach or suggest this additional limitation in combination with the other requirements of Claim 15.

Dependent Claim 18 requires and positively recites a mobile communication system as in claim 14, wherein each of the first and second estimate signals is a Rayleigh fading parameter estimate. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 19 requires and positively recites a mobile communication system as in claim 14, wherein a total diversity of each of the first and second symbol signals is at least twice a number of the plural remote antennas. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 21 requires and positively recites a mobile communication system as in claim 14, wherein each of the first and second input signals is a wideband code division multiple access signal. Being that Alamouti discloses TDMA transmission, Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 22 requires and positively recites a mobile communication system as in claim 21, wherein a total diversity of each of the first and second symbol signals is at least twice a number of the plural remote antennas. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 21.

Dependent Claim 23 requires and positively recites a mobile communication system as in claim 14, wherein the mobile antenna receives the first and second input signals over a common channel. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 24 requires and positively recites a mobile communication system as in claim 14, wherein the mobile antenna receives the first and second input signals over a common frequency band. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Dependent Claim 25 requires and positively recites a mobile communication system as in claim 14, wherein the first input signal comprises a data symbol and the second input signal comprises a complex conjugate of the data symbol. Alamouti fails to teach or suggest this additional limitation in combination with the other requirements of Claim 14.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"<u>Version with markings to show changes made.</u>"**

Claims 14-19, 21 and 22-25 stand allowable over the cited art and the application is in allowable form. Applicants respectfully request allowance of the application as the earliest possible date.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Specification – (marked-up version):

Replace the BRIEF DESCRIPTION OF THE DRAWINGS paragraph on page 4 with the following.

--A more complete understanding of the invention may be gained by reading the subsequent detailed description with reference to the drawings wherein:

FIG. 1 is a simplified block diagram of a typical transmitter using Space Time Transit Diversity (STTD) of the present invention;

FIG. 2 is a block diagram showing signal flow in an STTD encoder of the present invention that may be used with the transmitter of FIG. 1;

FIG. 3 is a schematic diagram of a phase correction circuit of the present invention that may be used with a receiver as in figure 8;

FIG. 4A is a simulation showing STTD performance compared to Time Switched Time Diversity (TSTD) for a vehicular rate of 3 kmph;

FIG. 4B is a simulation showing STTD performance compared to TSTD for a vehicular rate of 120 kmph;

FIG. 5 is a block diagram showing signal flow in an OTD encoder of the prior art;

FIG. 6 is a block diagram of a despreader input circuit of the prior art that may be used with a receiver as in figure 8; [and]

FIG. 7 is a schematic diagram of a phase correction circuit of the prior art; and

FIG. 8 is a space time block coded receiver of the present invention.--

Insert the following paragraph after line 24 on page 5.

--Referring now to FIG. 8, there is a space time block coded receiver of the present invention. The receiver includes despreader circuit 800 coupled to receive respective path-specific signals $r_j(i+\tau_j)$ for the i^{th} chip corresponding to paths j. These path-specific signals include a first input signal from a first antenna ANT 1 (FIG. 2) and a second input

signal from a second antenna ANT 2. The first input signal is transmitted along plural signal paths, each of the plural signal paths having a respective channel characteristic α_1^1 through α_j^1. The second input signal is also transmitted along respective plural signal paths, each having a respective channel characteristic α_1^2 through α_j^2. The despreader circuit (FIG. 8) produces and applies respective signals, for example signals R_j^1 and R_j^2 at leads 832 and 834, to phase correction circuit 810. Signal R_j^1 includes j symbols received at a first time from antenna ANT 1 according to equation [5]. Signal R_j^2 includes j symbols received at a second time from antenna ANT 2 according to equation [6]. The phase correction circuit is coupled to receive respective input signals and path-specific estimate signals, for example input signals R_j^1 and R_j^2, a first plurality of estimate signals and estimate signals α_j^{1*} and α_j^2 at phase correction circuit 810. The phase correction circuit produces and applies respective symbol estimates according to equations [7-8], for example first and second symbol estimates S_j^1 and S_j^2 at leads 836 and 838, to rake combiner circuits 820 and 822. The plurality of first symbol estimates S_j^1 correspond to the j signal paths from antenna ANT 1 and include a first symbol estimate S_1^1. The plurality of second symbol estimates S_j^2 correspond to the j signal paths from antenna ANT 2 and include a second symbol estimate S_1^2. Rake combiner circuit 820 sums first symbol estimates from each path of the phase correction circuit and produces a first symbol signal $\tilde{S}_1$ at lead 824 according to equation [9]. Likewise, rake combiner circuit 822 sums second symbol estimates from each path of the phase correction circuit and produces a second symbol signal $\tilde{S}_2$ at lead 826 according to equation [10].--

Rewrite the paragraph at page 5, line 26, as follows.

Referring now to FIG. 3, there is a schematic diagram of a phase correction circuit of the present invention that may be used with a remote mobile receiver as in figure 8. This phase correction circuit receives signals R_j^1 and R_j^2 as input signals on leads 610 and 614 as shown in equations [5-6], respectively.

Replace the paragraph on page 6 comprising equation [6] with the following.

$$R_j^2 = \sum_{i=N}^{2N-1} r_j(i+\tau_j) = \alpha_j^1 S_{[1]\underline{2}} + \alpha_j^2 S_1^* \qquad [6]$$

IN THE CLAIMS – (marked-up version):

14. (amended) A mobile communication system, comprising:

a mobile antenna arranged to receive a plurality of signals from multiple signal paths from each of plural remote antennas of an external source; [along respective signal paths;]

an input circuit coupled to receive the plurality of signals from the mobile antenna, the input circuit producing a plurality of input signals including a first input signal from a first remote antenna and a second input signal from a second remote antenna, at least one of the first and at least one of the second input signals corresponding to the same datum; and

a correction circuit coupled to receive a plurality of first estimate signals, a second estimate signal and the first and second input signals, the plurality of first estimate signals corresponding to respective signal paths of the first input signal, the correction circuit producing a first symbol estimate an a second symbol estimate in response to the first and second estimate signals and the first and second input signals.

19. (amended) A mobile communications system as in claim 14, wherein a total [path]diversity of each of the first and second symbol signals is at least twice a number of [transmitting] <u>the plural remote</u> antennas.

Please add the following new claims:

23. (New) A mobile communication system as in claim 14, wherein the mobile antenna receives the first and second input signals over a common channel.

24. (New) A mobile communication system as in claim 14, wherein the mobile antenna receives the first and second input signals over a common frequency band.

25. (New) A mobile communication system as in claim 14, wherein the first input signal comprises a data symbol and the second input signal comprises a complex conjugate of the data symbol.